U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-333/89-21

Docket No. 50-333

License No. DPR-59 Category C

Licensee: Power Authority of the State of New York
P.O. Box 41
Lycoming, New York 13093

Facility Name: James A. FitzPatrick Nuclear Power Plant

Inspection At: Lycoming, New York

Inspection Conducted: November 27 - December 1, 1989

Inspector: _____ 12-22-89
P. O'Connell, Radiation Specialist date

Approved by: _____ 12/26/89
W. Pasciak, Chief, Facilities Radiation Protection Section date

Inspection Summary: Inspection conducted November 27 - December 1, 1989
(Inspection Report No. 50-333/89-21)

Areas Inspected: This inspection was a routine unannounced radiological controls inspection. Areas reviewed include: Licensee Actions on Previously Identified Items, Audits and Appraisals, External Exposure Controls, Control of Radioactive Material, and ALARA.

Results: Within the scope of this review one open item was reviewed and closed and two apparent violations and one unresolved item were identified. The first apparent violation involved a failure to perform an adequate survey and the other apparent violation involved an example of a failure to comply with radiation protection procedures.

Details

1.0 Individuals Contacted

1.1 New York Power Authority

*R. Liseno, Superintendent of Power
R. Locy, Operations Superintendent
*J. McCarty, Radiation Protection Supervisor
*M. McMahan, Dosimetry Supervisor
*E. Mulcahey, Radiological and Environmental Services Superintendent
J. Solini, Health Physics General Supervisor
*K. Szeluga, Radiological and Environmental Services Supervisor
*G. Tasick, Quality Assurance Supervisor
G. Vargo, Radiological Engineering General Supervisor

1.2 NRC

R. Plasse, NRC Resident Inspector
*W. Schmidt, NRC Senior Resident Inspector

*Denotes those individuals attending the exit meeting on December 1, 1989.

The inspector also contacted other licensee and contractor personnel.

2.0 Purpose and Scope of Inspection

This inspection was a routine unannounced inspection of the licensee's radiological controls program. Areas reviewed included Licensee Actions on Previously Identified Items, Audits and Appraisals, External Exposure Controls, Control of Radioactive Material, and ALARA.

3.0 Licensee Actions on Previously Identified Items

Closed (50-333/89-13-01) Violation. The inspector reviewed the corrective actions taken by the licensee in response to an incident which occurred on June 12, 1989 where several workers received unplanned exposures resulting from a highly radioactive particle rising to the surface of the Spent Fuel Pool (SFP). The root cause of the incident was a failure of the licensee to conduct an adequate evaluation of the radiation hazards associated with introducing potentially buoyant materials into the SFP. On September 5, 1989 the licensee submitted their response, JAFP 89-0649, to the Notice of Violation outlining their corrective actions. The corrective actions included:

- Surveying the SFP and associated areas to locate any other potentially buoyant objects.
- Revising several procedures to reflect upgraded radiological controls, including requiring the wearing of alarming dosimeters when working near the SFP, removing buoyant material from the SFP, and enhancing "hot particle" controls for SFP work activities.

-Providing enhanced supervisory oversight of radiologically sensitive work activities.
-Providing training on the incident to workers involved with SFP work activities.

The inspector verified that all of the corrective actions specified in the licensee's response were satisfactorily completed. This item is closed.

4.0 Audits and Appraisals

The inspector reviewed the licensee's implementation of Procedure RPOP-7 "Radiological Incident Investigation and Reporting" (RIR). This procedure is used to document such incidents as poor radiological work practices, personnel contaminations, and failure to follow radiation protection procedures. Several of the closed RIRs did not document any corrective actions or other final resolution. The inspector discussed this matter with the Radiological and Environmental Services (RES) Superintendent. The RES Superintendent was aware as to what corrective actions had been taken for the RIRs in question, however these corrective actions had not been documented. The RES Superintendent stated that the licensee would evaluate how to change the Radiological Review Form, which is attached to the RIR, to document corrective actions and the final resolution prior to closing the RIR. This item will be reviewed during a future inspection.

The licensee also implements a Manager Observer Program in which supervisors in the RES Department tour the facility, observe work activities and document their findings. The inspector reviewed these documents and noted that the RES Superintendent and other RES Supervisors had been satisfactorily implementing this program.

The inspector spoke with the RES Superintendent as to whether independent corporate audits of the radiation protection program had been conducted. The RES Superintendent stated that approximately two years ago the corporate staff underwent reorganization and corporate audits of the radiation protection program had been discontinued.

The inspector noted that the Radiation Protection Manual, Chapter 17, dated February 3, 1988, requires, in part, in Section 17.4.1, that the Manager - Radiological Health and Chemistry, (Nuclear Generations Department, White Plains Office) is responsible for corporate monitoring and surveillance of the radiation protection program.

The inspector reviewed the audits of the radiation protection program which the Quality Assurance Department conducted. At the time of the inspection, Quality Assurance was conducting an audit of radiation protection records. The two most recent Quality Assurance audit of the radiation protection program, which RES management and Quality Assurance management provided the inspector, were conducted in February 1986 and in October 1988. The earlier audit was an audit of Respiratory Protection

Training and the later one involved review of enforcement follow-up actions.

The Quality Assurance Supervisor stated that Quality Assurance audits are routinely conducted for areas specified in the Technical Specifications i.e. Offsite Dose Calculation Manual (ODCM), Radiological and Environmental Monitoring Program (REMP), training etc., but Quality Assurance audits of the radiation protection program were not included in the 1989 Quality Assurance audit schedule and are not routinely scheduled. The licensee stated that two years ago the Quality Assurance Department had two Radiation Protection Specialists who routinely conducted Quality Assurance audits of the radiation protection program but these positions had been deleted.

The inspector noted that the Radiation Protection Manual, Chapter 17, dated February 3, 1988, requires, in part, in Section 17.3.1, that periodic audits and surveillances are to be performed by the Quality Assurance staff in accordance with the Quality Assurance Program. The Quality Assurance Program, dated June 15, 1987, requires, in part, in Section 17.2.18.1, that planned and periodic audits are to be carried out by the Quality Assurance organization to verify all aspects of the organization. Surveillance audits are conducted routinely on an unscheduled basis of ongoing or day-to-day activities to verify satisfactory completion of the activity. Specific program areas are audited so that the total program is reaudited within a scheduled period of time.

It was not resolved during the inspection whether, despite the apparent discontinuing of the corporate audit program in the radiation protection area, corporate audits had been done in accordance with program requirements. It was also not resolved during the inspection whether, despite the apparent lack of scheduling of Quality Assurance audits in the radiation protection area, Quality Assurance audits had been done in accordance with program requirements. The apparent discontinuation of corporate audits of the radiation protection program and the failure of Quality Assurance to schedule and conduct periodic surveillances of the radiation protection program to ensure that the total program is reaudited within a scheduled period of time are unresolved. (50-333/89-21-01)

5.0 External Exposure Controls

5.1 Dosimetry

The inspector reviewed several Daily Exposure Reports and verified that the proper authorizations had been obtained prior to allowing individuals to exceed the administrative dose limit of 1 rem/calendar quarter. The exposure records of selected individuals also were reviewed to verify that the licensee had a completed NRC Form-4 for each individual prior to allowing that individual to exceed 1.25 rem/calendar quarter. The inspector noted that errors made by contractors in computing their whole

body exposures on their NRC Form-4 had been noted and corrected by the Dosimetry Supervisor. This indicated good supervisory oversight in this area. During tours of the facility the inspector noted dosimetry being worn properly.

The licensee's dosimetry group processes all thermoluminescent dosimeters (TLDs) worn onsite with the exception of the TLDs occasionally worn when it is necessary to monitor individuals for neutron exposure. These TLDs are processed offsite by a contractor. The inspector verified that the contractor was currently accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) in Categories I through VIII, inclusive.

The inspector reviewed the licensee's NVLAP accreditation for the TLDs processed onsite. The licensee's NVLAP accreditation is effective until October 1, 1990 for Categories II, IV, VI, and VII. The licensee's accreditation encompasses the following types of radiation:

Accidents, high energy photons, (Category II)
High energy photons, (Category IV)
Photon mixtures, low energy and high energy photons (Category VI)
Mixtures of photons and beta particles (Category VII)

The licensee stated that individuals at their facility are not exposed to other types of radiations such as pure low energy photons (Categories I and III), or pure beta particles (Category V), therefore they did not believe it was necessary to be accredited in those categories.

The inspector reviewed the quality control checks which the licensee performs on the TLD processor. The quality control checks consist of control TLDs being processed with each batch of TLDs being processed, biweekly testing of the processor and blind sample TLDs being sent to the licensee six times a year by a contractor. The licensee's quality controls appeared to be adequate.

The inspector noted that the licensee's dosimetry algorithm recorded whole body doses based on TLD readings through 1000 mg/cm^2 of tissue equivalent absorber and the licensee did not have procedures in place to ensure that individuals' eyes are shielded with a material having a density thickness of at least 700 mg/cm^2. NRC Form-5 states "Unless the lenses of the eyes are protected with eye shields, dose recorded as whole body dose should include the dose delivered through a tissue equivalent absorber having a thickness of 300 mg/cm^2 or less".

The licensee stated that they record whole body dose through 1000 mg/cm^2 of absorber because NVLAP accreditation requires that amount of absorber. The licensee stated that they did not feel it was prudent to generate a second algorithm, that was not NVLAP accredited, to assign whole body dose. The licensee stated that several years ago they conducted a study which determined that, at their facility, the same dose was delivered through 1000 mg/cm^2 as was delivered through 300 mg/cm^2, however the

licensee could not locate this study during the inspection. The licensee supplied the inspector the results of another evaluation, completed during the inspection, which compared the TLD element 3 (300 mg/cm^2 absorber) reading with the TLD element 4 (1000 mg/cm^2 absorber) for 135 TLDs. This comparison indicated no measurable differences between the readings of the two elements.

The licensee's evaluation stated that electronic equilibrium may not be achieved at 300 mg/cm^2 for 6 Mev photons. This would make the 300 mg/cm^2 measurement nonconservative. The evaluation also stated that reactor coolant samples showed that the mean beta energy found at their facility was 0.313 Mev which is less than the minimum beta energy required to penetrate 300 mg/cm^2 (approximately 0.8 Mev). Based on this determination and the above TLD comparison study, the licensee concluded that recording whole body dose through 1000 mg/cm^2 was adequate at their facility.

The inspector reviewed several dose generation reports and noted that there did not appear to be measurable differences between TLD element 3 (300 mg/cm^2 absorber) readings and the TLD element 4 (1000 mg/cm^2 absorber) readings. The inspector stated that within the scope of this inspection, the licensee's method for assigning whole body dose appeared to be adequate. The inspector stated that a change in the isotopic concentrations of radionuclides found at their facility that results in higher energy betas (such as fission products in the reactor coolant) being found in the plant would require the licensee to reevaluate or change their method of assigning whole body dose. This item will continue to be reviewed during future inspections.

5.2 Posting and Control of Areas

The inspector reviewed the licensee's program for issuing and controlling the keys used to lock High Radiation Areas (HRA) in the plant. All HRA keys were accounted for either in the HRA Key Control Issue Log or permanently issued to an individual. During tours of the facility the inspector verified that HRA doors were locked.

The inspector conducted several tours of the facility verifying that areas were properly posted and personnel access controlled for radiation protection purposes. While touring the reactor building on November 28, 1989, the inspector noted that the general area dose rates on the drywell mezzanine were above 100 millirem/hr. Access to this area was not controlled in accordance with Technical Specification 6.11 (a) and the area was not posted as a High Radiation Area in accordance with 10 CFR 20.203(c). The most recent survey of this area was dated November 3, 1989 and indicated the general area dose rate to be 50 millirem/hr. The licensee surveyed this area, after the inspector brought this matter to Radiation Protection (RP) Supervision's attention, and determined the general area dose rate to be 280 millirem/hr.

The inspector stated that this was an apparent violation of

10 CFR 20.201 (b) which requires, in part, that each licensee shall make or cause to be made such surveys as (1) may be necessary for the licensee to comply with the regulations in this part, and (2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present. (50-333/89-21-02)

The licensee's immediate corrective actions for this finding included properly posting the area and surveying other areas of the facility to ensure that this was an isolated occurrence. The licensee also stated that, in the future, the survey frequency of this area will be increased from monthly to weekly.

5.3 Control of Survey Instruments

The inspector reviewed the calibration and source checking of radiation survey meters, including the licensee's integrating alarming dosimeters. On November 27, 1989 an individual was issued an integrating alarming dosimeter which had not been source checked since November 21, 1989. Procedure PDP-12 "DOS-502A Alarming Dosimeters" states that these dosimeters should be source checked prior to use to ensure that they are functioning properly. The inspector reviewed the Equipment Issue Log and noted no other examples of survey instruments or alarming dosimeters being improperly issued. The inspector verified that survey instruments in use had been source checked prior to use and had current calibrations.

6.0 Control of Radioactive Material

While reviewing the background count data and check source count data for the counting equipment at the control point the inspector noted that from November 8 to 28, 1989 the background on the SAC-4 (No. 440) ranged from 15 to 42 counts per 10 minutes. The instrument had not been decontaminated and RES Supervision had not been notified of the high background count rate.

The inspector noted that Procedure RTP-23 "SAC-4 Scintillation Alpha Counter Operation and Calibration" dated November 23, 1987, requires, in part, in Section 4.6.1 that "if the background is greater than 3 counts per 10 minutes, then decontaminate the instrument". Section 4.8 of this procedure also requires notification of a Radiological and Environmental Services (RES) Supervisor if any problems are encountered that cannot be resolved through the use of this procedure.

This is an example of an apparent violation of Technical Specification 6.11 "Radiation Protection Program" which requires, in part, that procedures for personnel radiation protection shall be prepared and adhered to for all plant operations. (50-333/89-21-03)

The inspector noted that the high background count rate on this counter resulted in the counter having an unacceptably high lower limit of detection (LLD). The counter's LLD was higher than the licensee's limit for removable contamination on objects being released from the radiation

controlled area and the limit used for posting contaminated areas. The daily background counts and source check results of the counting equipment had not routinely been reviewed by RP Supervision which indicated that RP Supervision oversight of this area needs improvement.

7.0 As Low As Reasonably Achievable (ALARA) Program

The inspector observed the training of the individuals involved in the transfer of resin from the phase separator to a high integrity container (HIC) for shipment offsite to a disposal site. The licensee estimated that the exposure rate at the top of the HIC, where individuals needed to secure the lid, could approach 100 R/hr. The ALARA planning for this activity was good. Prior to transferring the resin, the ALARA group made extensive use of temporary shielding, remote television monitors, remote handling tools, and several, timed, mock-up practice runs in order to minimize personnel exposure during this evolution. During the ALARA pre-job briefing, good communication was noted among all the individuals involved in the transfer including radiation protection personnel, contractor workers, and plant operators. Although the entire job evolution was not completed during the inspection, the inspector did note that the radiation protection coverage of the initial phase of the transfer was good.

The inspector reviewed a plant modification work package which indicated that the engineering design stage for plant modifications did not effectively take ALARA into consideration. Proper planning was not conducted for the installation of the jet pump instrument drain line which was completed during the outage in September. The instrument drain line had been improperly installed such that the recirculation pump seal carrier could not be moved. As a result of this error, the instrument drain line had to be removed, shortly after it was installed, so that the recirculation pump seal could be replaced. The instrument drain line then had to be reinstalled. During the next outage the instrument drain line will have to be removed again and rerouted correctly.

The removal and reinstallation of the instrument drain line resulted in an additional four man-rem of personnel exposure. Additional emphasis needs to be placed on thorough planning, during the engineering design stage of plant modifications, involving high exposure work activities.

The 1989 ALARA goal was 300 man-rem. At the end of November 1989 the licensee had already exceeded their ALARA goal by 44 man-rem. ALARA personnel stated that the reason the goal had been exceeded was primarily due to unanticipated work activities during the three week mini-outage in September. The ALARA department projected 116 man-rem for the outage and the actual cumulative outage exposure was 167 man-rem.

The inspector reviewed and discussed with ALARA personnel several of the ALARA post job reviews of major outage work activities. The inspector reviewed ALARA post job reviews of several unanticipated work activities which were completed during the outage. These work activities accounted

for the majority of the personnel exposure in excess of the ALARA outage projection. Notwithstanding the area for improvement noted in the engineering design stage of plant modifications, the ALARA group was effectively implementing the licensee's ALARA program.

8.0 Exit Meeting

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on December 1, 1989. The inspector summarized the purpose, scope, and findings of the inspection.